PHORESIS ON A NEOTROPICAL BUMBLEBEE
(HYMENOPTERA: APIDAE) BY *ANTHEROPHAGUS*
(COLEOPTERA: CRYPTOPHAGIDAE)

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On January 22, 1994, while collecting bumblebees in San Isidro, Costa Rica (702 m altitude), I observed a queen bumblebee (*Bombus pullatus* Franklin) carrying a beetle on her right leg and pollinating the flowers without any problem. I immediately caught the queen and her guest, and put them in an ethyl acetate killing jar where the beetle remained attached by its mandibles to the tibia of the right hind leg. The beetle (a female) which proved to be a new species of *Antherophagus* Latreille (Q.D. Wheeler & P. Fraissinet, pers. comm.) eventually released its hold in the killing jar. I found several records of this phoretic behavior in several North American bumblebee species (Packard, 1864; J.B. Smith, 1909; Blatchley, 1910; Wheeler, 1919; Plath, 1934) as well as some European records (Redtenbacher, 1858; Carus and Gerstaecker, 1863; Eichhoff, 1866; Gorham, 1869; Perris, 1869–70; Bugnion, 1869–70; Seidlitz 1869–70; Hoffer, 1883; Fowler, 1889; Sharp, 1899; Wagner, 1907; Reitter, 1911; Sladen, 1912; Reuter, 1913; Alford, 1975), but to my knowledge this is the first record in a Neotropical bumblebee species. Although Crowson (1981) described an *Antherophagus* species associated with *Bombus* Latreille in Central America, he did not make any reference to the particular species involved. Also Roubik (1989) mentioned that *Antherophagus* apparently transfer between foraging *Bombus* at flowers. *Antherophagus* species have been found in nests of *Bombus ephippiatus* Say also in Costa Rica (Chavarría in prep.). But it is interesting to note that the author has collected three nests of *Bombus pullatus* Franklin without beetles or any other ectosymbiont so in this case we can apply the term "phoresis." Since 1896 Lesne used

Manuscript received 17 April 1994.

the term "phoresy" and distinguished it from ectoparasitism by the fact that the portee does not feed on the porter and eventually dismounts and has no further relations with the latter. The earliest observations of "this habit" seem to have been made by the British coleopterist T.J. Bold (1856, 1871). The feeding habits of the adult and larval *Antherophagus* seem to have been observed by some of the authors mentioned above, but they do not clearly state their observations. Charles Janet (1897) studied the known cases of phoresy more comprehensively and expanded the concept and distinguished no less than six different categories. Several authors have reported cases of phoresy (Banks, 1911; Warner, 1903; Brues, 1917a, 1917b; Rabaud, 1917; Wheeler, 1919). The majority of them made reference to *Antherophagus* and the ways it attaches to the legs, mouthparts or antennae of bumblebees for the purpose of being transported. *Antherophagus* have a very characteristic structure of the mandibles which enables them to grasp firmly any of the bee's appendages, and they have red integument with golden yellow hairs that is characteristic of many myrmecophilous beetles.

ACKNOWLEDGEMENTS

I thank Quentin D. Wheeler and Peter Fraissinet (Cornell University) for their help in identifying the beetle. I express my gratitude to the people at the Universidad de Costa Rica, particularly Paul Hanson and Humberto Lezama at the Museo de Insectos for their hospitality and support. Field studies in Costa Rica were supported by a post-course award from the Organization for Tropical Studies (OTS) and the Pew Charitable Trust, and the Graduate Student Council (Harvard University).

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